

WaTER PROGRAM

FOR CONTAMINANT FACT SHEETS



See related Fact Sheets: Acronyms & Abbreviations; Glossary of Terms; Cost Assumption; Raw Water Composition; and Total Plant Costs.

Water Treatment Estimation Routine (WaTER)

Some cost estimates used to develop some of the contaminant Fact Sheet cost curves and the Total Plant Cost curves were derived from Reclamation's WaTER program. WaTER is an Excel spreadsheet application developed for use with Reclamation's MTP. The program is a result of a cooperative effort between Reclamation and the National Institute of Standards and Technology.

Unlike other cost estimation programs that require the user to have information about the size of equipment and chemical dosage rates, the only inputs required for the WaTER program are the production capacity and raw water quality composition. The program employs cost indices as established by the *Engineering News Record*, Bureau of Labor Statistics, and the Producer Price Index, and derives cost data from *Estimating Water Treatment Costs*, volumes 1 and 2; EPA-600/2-79-162a; August 1979. Refer to the Cost Assumptions Fact Sheet for detailed cost data information.

The program has the following capabilities: (1) provides cost estimates for all treatment processes used in the MTP; (2) contains default values which can be customized if more accurate values are available; (3) is expandable to include new processes as they are developed; and (4) is user friendly.

The following processes are included in the program: pumping systems; centrifugal pumps; metering pumps; alum coagulation (dry/liquid); ferric sulfate coagulation; lime-soda ash softening; acid feed; polymer addition; potassium permanganate oxidation; ion exchange; upflow solids contact clarifier; gravity filtration (sand/dual/mixed); granular activated carbon filtration; microfiltration; reverse osmosis; nanofiltration; electrodialysis; clearwell storage; chlorine disinfection; chloramine disinfection; and ozone disinfection.

The program (suitable for PC or Mac environments) and user manual are available for distribution to interested parties. Or they can be accessed at:

<http://www.usbr.gov/water/desal.html> - Task E (separate program for PC users and Mac users)

<http://www.usbr.gov/water/reports.html> - #43 (user manual)

As discussed on the Cost Assumptions Fact Sheet, construction and annual O&M costs not estimated by the WaTER program were derived from *Estimating Water Treatment Costs*, volumes 1 and 2, EPA-600/2-79-162a, August 1979; or from equipment manufacturer's product data information.